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COMPLETE SPECIFICATION

Improvements in or relating to the preparation of Individual Tooth Prostheses

I, ALFRED LANGENSCHIEDT, of 5 Graben-
strasse, Radevormwald/Rheinland, Germany,
of German nationality, do hereby declare the
invention, for which I pray that a patent may
be granted to me, and the method by which it
is to be performed, to be particularly de-
scribed in and by the following statement:—

The invention relates to a device for use as
a technical aid for preparing individual tooth
prostheses.

In the production of individual tooth pros-
theses, such as jacket crowns, half crowns, in-
lays and the like, the known method com-
prises taking a copper collar or ring impres-
sion in the mouth of the patient over a pre-
pared tooth stump and then taking a plaster
impression of the whole jaw over the copper
collar or ring while the latter is still in the
mouth. The copper ring is filled with a special
material such as a suitable silicone or alginate
base which retains the shape of the patient's
tooth stump in a negative sense.

By this procedure there is obtained a nega-
tive plaster impression of the patient's upper
or lower teeth and gums in which is embedded
the copper ring containing a negative impres-
sion of the tooth stump in the special material.
A work model of the tooth stump is then
made from the copper ring impression by fill-
ing it with modelling material and shaping a
root-like extension of the same material ex-
tending outwards from the copper ring. With
the common modelling materials such as
amalgam, modelling cement or artificial resin,
used for preparing the work model of the tooth
stump, the copper ring impression has to be
removed from the plaster impression in order
to be filled with the aforementioned material,
because filling in of the copper ring impres-
sion was only possible by hand in view of the
shaping of the root-like extension of the
modelling material which should extend from
the copper ring by about 1.5 cm. This exten-
sion was shaped to have flat inclined sides,
the faces being irregular. Upon re-inserting
into the plaster impression, difficulties were

often encountered particularly, if the copper
collar is circular and without any markings
to facilitate correct orientation or if the plaster
surrounding the copper ring could be easily
damaged whilst working on the modelling
material.

The plaster impression, now containing the
copper ring filled in with modelling material
shaped to form the root-like extension, then
has plaster cast on to it. After removal of the
plaster impression and the copper ring a clear
reproduction of the teeth and gums of the
patient in cast plaster is obtained, the particu-
lar tooth on which a prosthesis is to be worked
being apparent as a removable work model in
the plaster work model of the jaw.

During the next step of the known process,
the individual tooth prostheses, jacket crowns,
half crowns, inlays and the like are fabricated
on the work model of the stump. To do this,
such work model has to be repeatedly removed
from and re-inserted into the cast plaster
model. This causes fine particles of plaster to
be rubbed off and the seating of the stump
model in the plaster model is liable to become
inaccurate. Accordingly, the stump model may
no longer assume its predetermined accurate
position in the plaster model. The result is
that the completed tooth prosthesis on the
stump model assumes a different position in
the mouth of the patient than that determined
by the impression. It is an aim of the present
invention to overcome these disadvantages.

The invention provides a device for use as a
technical aid for preparing an individual tooth
prosthesis, comprising a shell adapted to be
mounted in a work model against rotation and
a pin comprising a tail portion adapted to be
removably inserted with a snug fit into the
shell in such a manner that it is prevented
from rotating relatively to the shell and a head
portion on which a reproduction of a patient's
tooth may be formed from a modelling
material.

In a particularly convenient form of em-
bodiment of the work model, in order to secure

the pin against rotation about its longitudinal axis, the tail of the pin is constructed as a polygonal element, and the inner and outer profiles of the shell are also polygonal.

- 5 In order that an associated shell and pin cannot be confused, it is convenient to arrange for the shell and the pin tail to be in the form of a polygon irregular in cross-section.

- 10 In a further form of the device, in order to secure the shell and pin against rotation about their common longitudinal axis, the shell and the tail of the pin are provided one with an indentation and the other with a projection engageable with the indentation.

- 15 The device can also advantageously be so constructed that the tail tapers towards its free end.

- 20 It is particularly advantageous for working on the work model to shape the head of the pin in the form of the crown of a tooth on a reduced scale.

Finally, it is convenient to have a shell and pin standardized according to tooth size.

- 25 Examples of embodiments of the invention are illustrated diagrammatically in the accompanying drawings, wherein:

Fig. 1 is a front view, in section of a shell with a pin situated therein;

- 30 Fig. 2 is a side view of the shell and pin illustrated in Fig. 1;

Fig. 3 is a sectional view taken on the line A—B of Fig. 2, but on a larger scale;

- Figs. 4—8 show various cross-sectional forms of the shell and the tail of the pin;

- 35 Fig. 9 is a view, partly in section and partly in elevation, of a plaster impression taken in the patient's mouth, with a copper collar or ring arranged in the impression and a pin and shell shown above the ring;

- 40 Fig. 10 shows the same elements as in Fig. 9, but in the assembled condition;

Fig. 11 is an elevational view of part of a jaw with teeth therein and a prepared tooth stump, and

- 45 Fig. 12 is a view partly in section and partly in elevation, of a large work model with shell and pin therein and with teeth.

- Referring to the drawings, a pin 2 is adapted to be introduced with a snug fit into a shell 1.

- 50 The shell 1 is mounted in the large work model 3 (Fig. 12) which is adapted to be formed of plaster, during the production of the large model. The tail of the pin 2 is not quite seated into the shell 1 as shown in Fig. 12.

- 55 Owing to its outer configuration, e.g. owing to its polygonal cross-section, the shell 1 is prevented from rotating about its longitudinal axis when it is mounted in the large work model 3.

- 60 When the pin 2 is fully seated in the shell 1 it is similarly secured against rotation about its own longitudinal axis relatively to the shell, as will be apparent from the cross-sectional forms illustrated in Figs. 3—8.

The shell 1 and the pin 2 consist of a substance, preferably plastics material, to which the modelling material adheres.

- The shell 1 and the tail of the pin are of irregular polygonal cross-section in the form 70 illustrated in Figs. 3—6.

- In the forms illustrated in Figs. 7 and 8, the shell 1 and the pin 2 are prevented from rotating about their common longitudinal axis 75 by providing the shell 1 and the tail with inter-engaging indentations (Fig. 7) or with a projection engaging into an indentation (Fig. 8).

- In the form of embodiment illustrated in Fig. 7, the indentation 4 in the shell 1 is inwardly directed and engages in the corresponding indentation 4', which is situated in the pin 2. The plaster mass 12 can penetrate 80 from the exterior into the indentation 4 when the large work model 3 is formed, and in this way the shell 1 is prevented from rotating about its longitudinal axis in the finished work model 3.

- In the form of embodiment illustrated in Fig. 8, the indentation 5 arranged in the shell 1 extends in the outward sense, and into the indentation 5 there engages a matching projection 5' which proceeds from the pin 2. 90

- Referring to Fig. 9 of the drawings, a copper ring 7 is situated in a plaster impression 6 which is taken in the patient's mouth. This copper ring 7 is so filled with a special impression material 8 such as a suitable silicone or alginate base, that when the impression is made a cavity 9 in the material 8 which is a negative representation of the shape of the prepared tooth stump 10, is obtained such as is illustrated diagrammatically in Fig. 11. 100

- The cavity 9 is then filled with a modelling material 11 as indicated in Fig. 9 by the dotted portion. This modelling material 11 comprises a substance which adheres to and forms a bond with the pin 2. 105

- While the modelling compound 11 is still pliant and therefore still deformable, the head of the pin 2 is so pressed into the modelling material 11 (Fig. 9) that it takes up the position shown in Fig. 10. The portion of the modelling material 11 which runs over the upper edge of the copper ring is removed. 110

- After the modelling material 11 hardens, a further plaster mass 12 is poured in a manner known *per se* into the plaster impression 6 containing the shell and pin 2. After this plaster mass 12 hardens, the plaster impression 6 with the copper ring 7 and impression material 8 situated therein are removed so as to leave free the plaster model shown in Fig. 12 for acting as a work model 3 with the shell 1 and pin 2 situated in the said model 3, the shape of the modelling material 11 adhering to the head of the pin 2 being a reproduction of the patient's tooth stump 10. 115

- In the region of the pin 2, the plaster model 12 is so cut to form a recess 13 that the pin can be removed from the shell, the lower 120

portion 14 and the crown portion 15 of the head of the pin being exposed.

The pin 2 can then alternately be withdrawn from the shell 1 and reinserted therein.

- 5 When finishing the tooth prosthesis, this can be continued until the prosthesis prepared on the pin 2 has attained its desired final form and position relatively to the neighbouring teeth.

10 WHAT I CLAIM IS:—

1. A device for use as a technical aid for preparing an individual tooth prosthesis, comprising a shell adapted to be mounted in a work model against rotation and a pin comprising a tail portion adapted to be removably inserted with a snug fit into the shell in such a manner that it is prevented from rotating relatively to the shell and a head portion on which a preproduction of a patient's tooth may be formed from a modelling material.

- 20 2. A device according to Claim 1, wherein the pin and the shell are made of plastics material.

3. A device according to any preceding claim, wherein the pin is made of such a material that a synthetic resin modelling material will adhere to it.

4. A device according to any preceding

claim, wherein the tail portion of the pin and the inner and outer cross-sectional profiles of the shell are polygonal. 30

5. A device according to Claim 4, wherein the shell and the tail portion of the pin are in the form of an irregular polygon.

6. A device according to any one of Claims 1—3, wherein the shell and the tail of the pin are provided one with an indentation and the other with a projection engageable with the indentation. 35

7. A device according to any preceding claim, wherein the tail of the pin tapers towards its free end. 40

8. A device according to any preceding claim, wherein the pin head has the shape of the crown of a tooth on a reduced scale. 45

9. A device according to Claim 8, wherein the shell and the pin are standardized according to teeth sizes.

10. A device for use as a technical aid for preparing an individual tooth prosthesis, substantially as hereinbefore described with reference to the accompanying drawings. 50

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This drawing is a reproduction of
the Original on a reduced scale.



Fig. 1

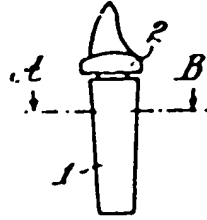


Fig. 2



Fig. 3



Fig. 4



Fig. 5

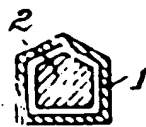


Fig. 6

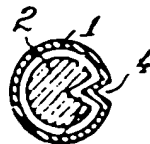


Fig. 7

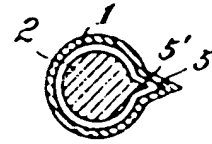


Fig. 8

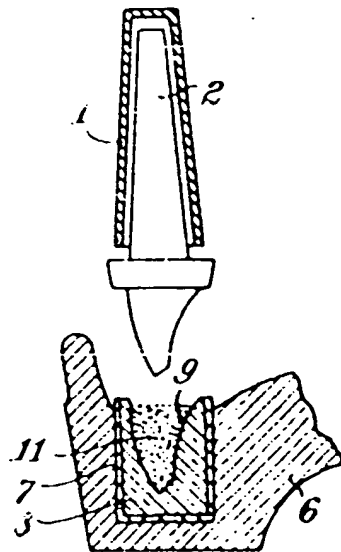


Fig. 9

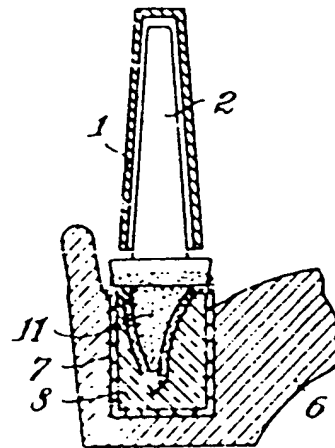


Fig. 10

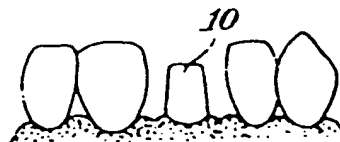


Fig. 11

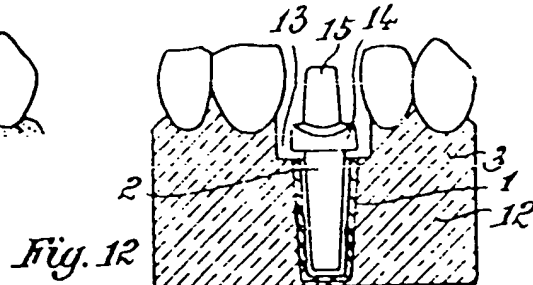


Fig. 12